MARS BULLETIN

MARCH 1953
Vol. 4 No. 1

Military Affiliate Radio System

In This Issue:
MOBILE SERVICE
IN WASHINGTON
Page 4

A3UWI: Chief, Mars (Army).

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ABOUT THE COVER: MARS *Air Force members of the metropolitan Washington, D. C., area have frequent mobile exercises which include both military and civilian participants. The Pentagon Building is a popular rendezvous point.*

CONTENTS

	Page
CQ . . . CQ . . . CQ . . .	2
Editorial	3
Mobile Service in Washington	4
Exact Frequency Operation of the Viking I	6
A Crystal Oscillator Adaptor for the Signal Shifter	7
A Multi-Band Mobile Antenna	9
A Pre-amp Unit for 10 Meters	12
Signal Corps Extension Courses Offer Free Military and Technical Training	15
Military Amateurs in Australia	16
Signal Corps Mobile TV System	18
USAF Eclipse Expedition	22
Turner Air Force Base, Georgia	23
Activities at Large	24
Testing MARS In Panama	27
V. F. W. Honors AF4PJU	29
Operation Aberdeen	29
MARS Radioteletypewriter Activity	30
Military Use of Transistors	31
1952 Armed Forces Day—Hawaii	32

CQ . . . CQ . . . CQ . . .

The Military Affiliate Radio System is a joint Army-Air Force operation under the jurisdiction of the Chief Signal Officer, Department of the Army, and the Director of Communications, Department of the Air Force. These jurisdictions operate jointly for determination of policy but separately for operational control. The MARS BULLETIN is designed to provide information to all members; to throw open for discussion all problems of an operational, technical, or organizational nature; to provide a "mike" for each member; to provide a network or headquarters organization; and to keep all members informed of latest developments concerning MARS.

The BULLETIN will be distributed to all members. It will be prepared in the offices of the Chief Signal Officer of the Army and the Director of Communications of the Air Force.

Comments, suggestions, and constructive criticism are solicited from all members. Address correspondence to: The Editor, The MARS BULLETIN, Room BE 1000, the Pentagon, Washington 25, D. C.

EDITORIAL

By Major Charles C. Mack (USAF)
Chief, MARS (Air Force)*

Two recent changes have been made in the MARS Program. The program has a new name, and the Army MARS has a new Chief.

The change in name does not affect MARS operations. Qualification for membership still is predicated on possession of a valid amateur radio operator license. Methods and procedures approved for MARS operations still are rooted in the Joint Army, Navy, Air Force Publications (JANAP). However, the new name—Military Affiliate Radio System—does indicate some of the broader aspects and concepts of the proposed use of the system to augment military radio circuits. While many of us are reluctant to part with the word "amateur" as part of our system title, the fact remains that it is a departure affecting plans only; our operations and our cooperative associations with other amateur radio services will continue as effectively, and we hope as amicably, as they have in the past 4 years.

The new Army Chief, MARS is Maj. James A. Long (A3UWI) who has been a leader in the MARS program since its activation in 1948. The MARS is happy to welcome Major Long to the new assignment.

A3UWI comes to the Pentagon from USARPAC where he was Theater MARS Director. He replaces Capt. Lester A. Peterson (A4YCV) who has moved to a new assignment in Alaska.

Close cooperation between the Chiefs, MARS has contributed greatly to the success of the program.

Captain Peterson, during his tour as Chief, MARS (Army), set a high example of Service cooperation for his successor. Early indications are that Major Long will prove to be equally cooperative. Making a joint operation work is a job requiring day-to-day coordination and decisions. The Chiefs, MARS truly represent unification in action.

Welcome, Major Long. It will be a pleasure working with you.

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*Prior to publication Major Mack has departed for an oversea assignment. His successor will be welcomed in the next issue of the MARS BULLETIN.

MOBILE SERVICE IN WASHINGTON

AF3TMM and AF4PXI check out a TCS–12 transceiver modified for 10-meter operation.

The Air Force Washington, D. C., Mobile Radio Net started a year ago with 16 members and a goal to provide normal and emergency communication service within and around the strategic area of Washington, D. C.

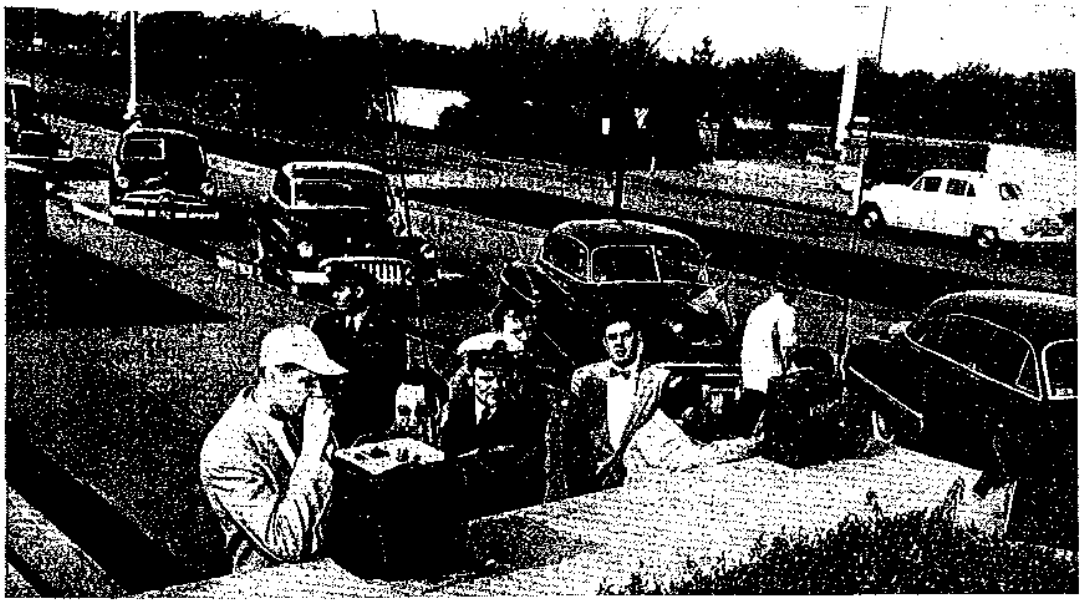
A surprising feature of the net is the number of mobile members assigned who are active in every drill. With fixed stations, the mobiles form a chain around the Washington area.

During routine drills, two fixed stations act as Net Control, one on 3307.5 kcs. and one on 27994 kcs. However, during simulated or actual emergencies, the mobiles act independently with the assumption that commercial power has been cut off. The net manager for each of the 'phone nets is a mobile member.

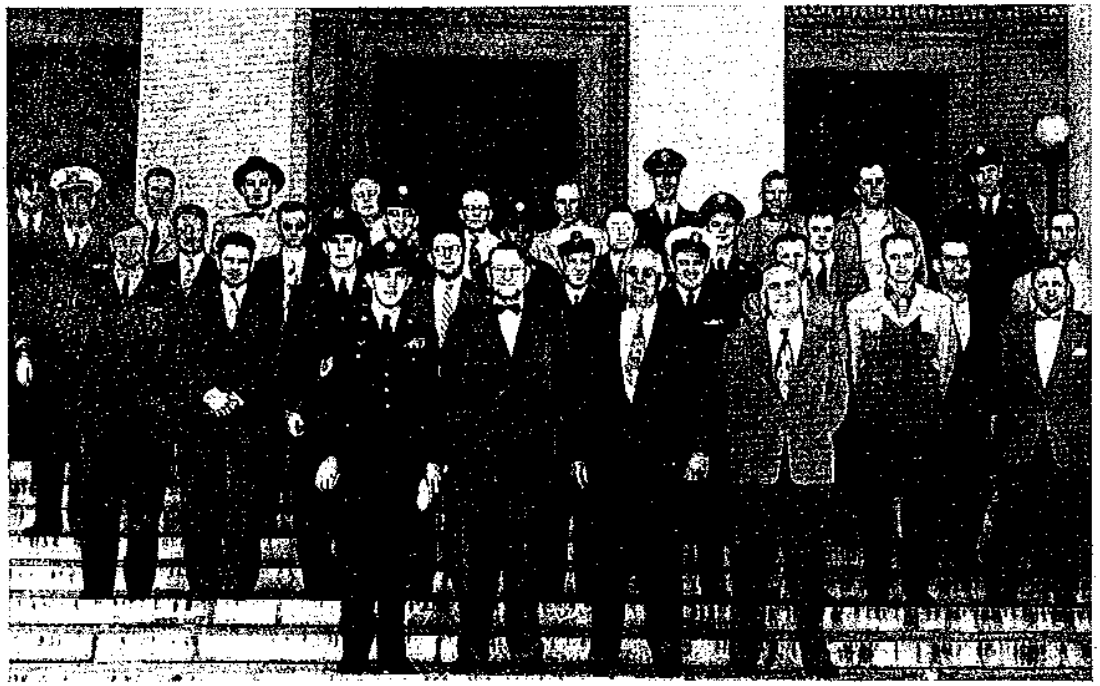
The master control station AIR/K4AF is located at the Pentagon; fixed stations provide the long haul communications and relays, when necessary. Each net night one mobile station is directed to rendezvous with a designated CW station and act as liaison between the three nets which are operated simultaneously.

A recent simulated emergency operation conducted by local military organizations and the Washington Amateur Radio Club was termed highly successful by the Chief, MARS (Air Force).

Area coverage maintained by mobile and fixed stations includes Montgomery and Prince Georges Counties, Maryland; Washington, D. C.; Fairfax and Arlington Counties, Virginia; and the city of Alexandria, Virginia.



Washington area MARS mobiles rendezvous at the Pentagon Building for a week-end exercise.



A Sunday turnout of Air Force MARS members in the Washington area.

EXACT FREQUENCY OPERATION OF THE VIKING I

It has been reported to the Chief, MARS (Army) that when the regular FT-243 MARS-issue crystal units are used in the Viking I radio transmitter, the output frequency has been found to differ from the rated frequency of the crystal by from 1 to 2 kilocycles.

According to a letter from the manufacturer, the crystal should be ground and calibrated for the Pierce oscillator circuit that is incorporated in the transmitter in those cases where the Viking I is required to operate on an exact frequency.

The manufacturer advises, "In cases where crystals for the exact frequency are on hand but are ground for use in an oscillator circuit other than the Pierce, the transmitter may be modified as shown in the attached alternate oscillator circuit diagram." (See fig. 1.)

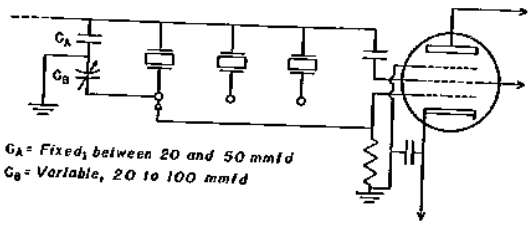


FIGURE 1.

"Addition of capacitors C_a and C_b changes the oscillator circuit to hat of an electron-coupled Colpitts for the one crystal socket to /hich they are connected. C_b may be variable so that individual rystals may be calibrated against a secondary frequency standard. f it is necessary or desirable that more than one socket be reserved or this use, additional capacitors C_b may be added, one for each ocket. The balance of the crystal sockets are, for practical purposes, unaffected although capacitor C_a remains permanently connected from grid to ground."

Using units are authorized to make this oscillator circuit modification when such is necessary for operation within frequency tolerance. /hen this modification has been made, a permanent-type notice should posted inside the transmitter cabinet indicating which crystal ckets have been altered for Colpitts type operation. This modification data also should be entered in the Viking I instruction book.

A CRYSTAL OSCILLATOR ADAPTOR FOR THE SIGNAL SHIFTER

By Richard A. Gilson A3NQA

The Meissner deluxe Signal Shifter used by many MARS stations has the one disadvantage of not being adaptable for crystal operation without the addition of a crystal oscillator stage. The advantage and the necessity for crystal operation on "spot" net frequencies should be apparent to any active MARS member. The modified Pierce oscillator described in the December 1951 issue of the MARS BULLETIN for use with Collins PTO exciters may readily be arranged for use with the Signal Shifter.

The crystal oscillator adaptor in use at A3NQA and illustrated schematically in figure 1 differs from the A5QVE one in that it uses a 6V6 beam power tube for the oscillator, and has provision for keying the oscillator cathode circuit. Also, a normally-open SPST relay is incorporated which enables the operator to control the oscillator by means of the mode switch on the Signal Shifter proper.

All of the power and control leads terminate on the seven-pin male chassis plug, as does the r-f output lead. The r-f lead from output coupling capacitor C5 to chassis plug pin 6 uses a short length of RG–8/U r-f cable.

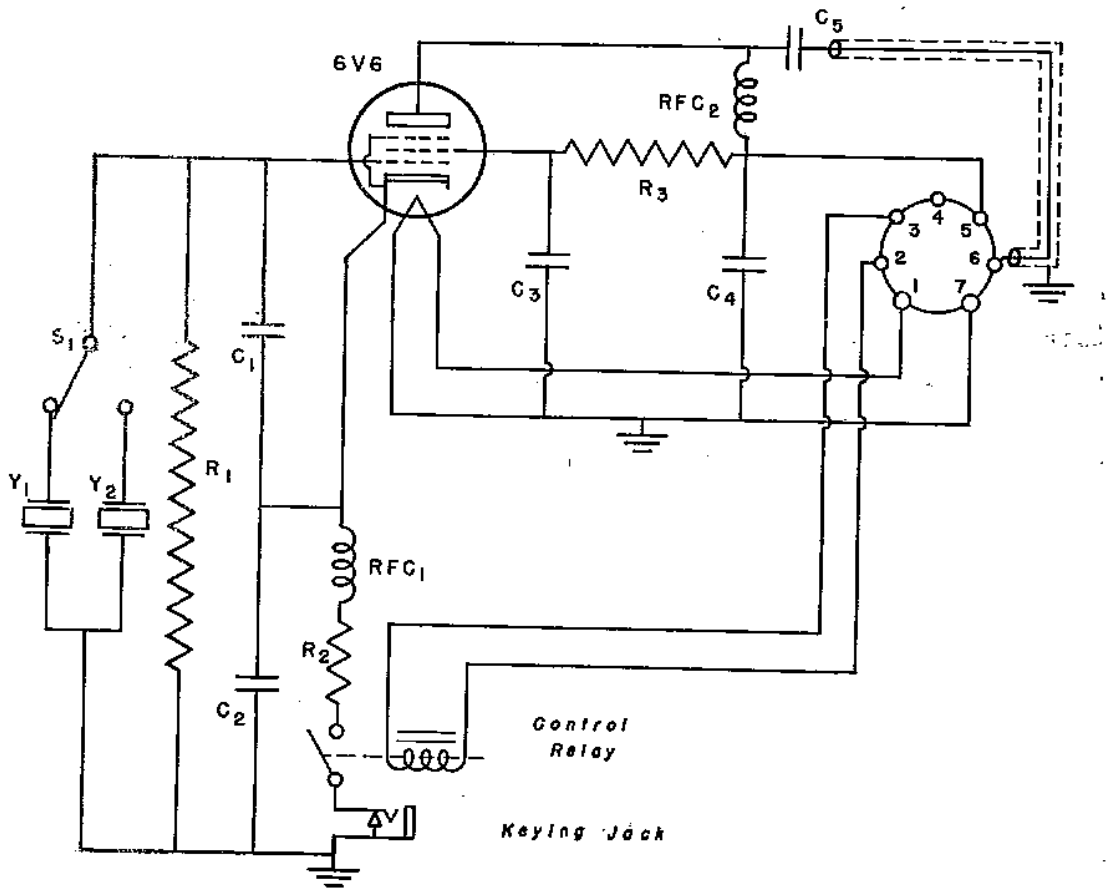


FIGURE 1.

The tuning range of the 6L6 output stage of the Signal Shifter is broad enough to provide output on any of the MARS frequencies in the 4000 kc to 4100 kc range using the regular 3500–4000 kc coil set without retuning the Signal Shifter. It is possible to change from variable-frequency to crystal controlled operation by means of the ECO-Xtal switch on the panel of the Signal Shifter.

This oscillator has been in use by A3NQA since September 1951 and has proven satisfactory in every detail.

Parts List

C1	Grid excitation capacitor	20 mmfd, mica.
C2	Feedback capacitor	150 mmfd, mica.
C3	Anode grid bypass capacitor	.002 mfd, paper.
C4	Plate bypass capacitor	.002 mfd, paper.
C5	R-f output coupling capacitor	100 mmfd, mica.
R1	Grid leak resistor	50,000 ohms.
R2	Cathode bias resistor	400 ohms.
R3	Anode grid voltage dropping resistor	100,000 ohms.
Rfc 1	Cathode load inductor	2.5 millihenrys.
Rfc 2	Plate load inductor	1 millihenry.
Ry 1	Control relay	SPST, normally open; 110 VAC solenoid.

VEST-TYPE BATTERY

A major difficulty in maintaining radio communications in the Arctic involves the operation of small, hand-carried or man-packed radio sets normally powered by dry batteries. While the radio itself operates satisfactorily at low temperatures, standard dry batteries rapidly lose voltage and become inoperative. As an answer to this problem, the Signal Corps Engineering Laboratories have designed a flexible cased battery which can be worn as a vest under arctic-type clothing, thus furnishing protection against extremely low temperatures by utilizing body heat to keep the batteries warm. First models of such a device for use with Radio Set AN/PRC–6 were obtained from B. F. Goodrich. Additional investigation of case materials and specific batteries for other radio sets is now proposed.

A MULTI-BAND MOBILE ANTENNA

By A1JOT

This is the story of how A1JOT went mobile.

After much reading and planning it was decided to purchase a commercial rig. With procurement of a Harvey Wells TBS–50C came a few installation problems, the most important of which was the selection of a proper mobile antenna. It was decided to operate the rig on 10 and 20 meters as well as 3940 and 4080 kc. A radio catalog revealed an interesting description of a multi-band mobile antenna of high efficiency with replaceable coils for the different bands called the Master Mobile. However, unnecessary work would be entailed when rapidly QSYing from band to band. The antenna was purchased in spite of its limitations and the coil cut for 3940 kc. Operations seemed to bring good reports on that frequency.

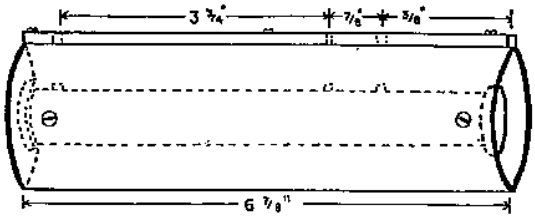


FIGURE 1.

Something had to be done about operating on the other bands without becoming involved in disassembling the antenna each time the bands were changed. With this in mind a visit to W1WK, Leon G. S. Wood, of Wollaston, Mass., was made. Woody has a good reputation for being able to put out a good mobile signal; it was known that he used some sort of special antenna. W1WK was using a Master Mobile antenna with an 80-meter coil for operation on 10, 20, and 75 meters. This antenna had been modified by tapping the coil and using a shorting screw to change bands. The results obtained proved that it was an efficient radiator. The necessary instructions were received for adding the frequency 4080 kc, together with pertinent construction details and testing procedures. Now began the construction phase.

The *first step* was to remove the antenna from the vehicle, disassemble, and remove all the wire from the coil form. (This coil in its original form had a resonant frequency of 3600 kc. By removing 23 turns from the bottom end, it then resonated at 3940. This left the coil with 116 turns close wound covering a winding distance of $3\frac{3}{16}''$.)

Second step—A piece of brass, approximately $\frac{1}{8}''$ thick, $\frac{5}{16}''$ wide and $6\frac{1}{2}''$ long, was bolted vertically on the side of the aluminum coil

shield. This was secured at the extreme ends and in the center by three 6/32 machine screws, lock washers, and nuts. Necessary holes were drilled for the 10 and 20 meter and 4080 kc frequencies. These holes were tapped for 6/32 machine screws.

Third step—The antenna was reassembled and a long 6/32 screw with a pointed end was inserted in each of the tapped holes until it touched the coil form hard enough to mark it. The antenna was again disassembled.

Fourth step—The contacts for the 10, 20, and 4080 taps were made of three brass wood screws with approximately 3/16 heads. The shank of the screw was cut off so that approximately 3/16" remained. Holes were drilled in the coil form of sufficient size to necessitate forcing the screws into the holes. The heads of these screws were made ready for soldering.

Fifth step—Number 20 solid enameled wire was used for the coil. One end of a spool of this wire was fastened to the bottom machine screw on the coil form. The wire was soldered to the 10-meter contact. The 20-meter coil was then wound and as the wire passed over the 20-meter contact, it was again soldered. The winding was continued, repeating the process at the 4080 kc tap, and the coil terminated at the top brass machine screw of the coil form. The antenna then was reassembled and mounted on the vehicle and a piece of RG 8U (52 ohm) coax 6 feet long connected for the transmission line. (This was long enough to reach the transmitter which was mounted in the trunk.) This completed the construction phase.

The *sixth step*, and the most difficult, began with a check of the 20 meter coil. The equipment at hand was a grid dipper and an antennascope (see Sep 50 CQ). These two instruments are a must when you desire to get the maximum efficiency out of your antenna. Considerable difficulty was experienced in getting the 20 meter coil to resonate properly due to the large tuning capacity used in the dipper, however, satisfactory adjustment was eventually made. Considerable removing and spacing of turns was required before the job was completed. Adjustment was made on the 4080 and 3940 taps in a similar manner. A brass 6/32 x 1¼" machine screw with wing locking nut was used as the shorting screw.

Seventh step—Receiving checks were made with each tap. The results with a Gonset Tri-Band converter were far superior to that of an 8-foot whip antenna. Subsequent transmitting checks on 3940 and 4080 indicate the antenna radiates the RF in fine style. The other bands also load well.

Construction Hints

1. Turns on the coil must be kept close together.
2. Contacts should be only as large as necessary.

3. Put a ball of solder on the contacts and on the machine screw used for shorting purposes.
4. Make sure all connections are well soldered and holes for machine screw contacts are kept clean.
5. Use a wing nut for locking the shorting screw.
6. Insert short screws in the tapped holes so that the weather and dirt will not give you poor contacts between the brass strip and the shorting screw.
7. With dirt and rain to be considered, it is best to keep the coil contacts facing in the direction of the rear of the vehicle.
8. To improve the contact between the coil shield and the top section of the antenna, tie the brass ferrule on the top end of the coil, substitute a brass tinned washer for the rubber washer, replace the coil shield and put rubber washer next to coil shield with metal washer between rubber and base of top section.

Adjustment Hints

1. The Master Mobile antenna is a high "Q" antenna, so be sure you do nothing to reduce the "Q." Inserting the shorting screw apparently does not change the "Q," however, actual measurements were not made.
2. Removal of turns and spacing is most critical at the top of the coil. When final adjustments are being made extreme care should be used in spacing turns for a considerable change in frequency results from only slight alterations in turns and spacing. One turn removed from the bottom raised the frequency approximately 15 kc.
3. Use a grid dipper, antennascope, and an accurate frequency measuring device for best results. These antennas tune quite sharp. Adjustment while using this equipment was made with comparatively little difficulty.
4. Be sure the antenna is as clear of surrounding objects as possible when tuning adjustments are being made.

Conclusion

This is a highly efficient antenna, very easy to change bands, and relatively simple to construct. The work involved is more than compensated for by its operation. Further modification can be made for MARS work by eliminating the 20 meter tap and installing a 4020 kc tap instead.

A PRE-AMP UNIT FOR 10 METERS

By Roy R. Trahan (A5OMH)

This article describes a 10-meter preamplifier unit. It is a two-stage affair employing three tuned radiofrequency circuits with a 6SG7 remote cut-off pentode for the first r-f stage and a video-type 6AG7 power pentode for the second r-f stage. The whole assembly, together with power supply, is mounted on a steel 7½ x 9 x 1½ chassis and installed in an appropriate cabinet.

As shown in the diagram, the preamplifier is tuned by three tandem-ganged 50 mmfd variable capacitors, with C1 across the secondary of the input transformer, C2 across the primary of the interstage transformer, and C3 across the primary of the output transformer. These capacitors are individual units, each having an extension shaft at the rear end for convenience in coupling to the following capacitor.

The three radiofrequency transformers, L1–L2, L3–L4, and L5–L6, are hand-wound of No. 18 AWG enameled wire on type XR–50 mica-filled coil forms fitted with permeability tuning cores. The primary of the input transformer L1, and the secondaries of the interstage and output transformers, L4 and L6, are each wound on the "cold" end of their respective units.

R-f sensitivity control is accomplished by means of the rheostat R2 in the common cathode circuit. Resistor R1 serves to limit the minimum resistance of this circuit. While it is not shown in the schematic diagram, the A5OMH model has the power on-off switch ganged with the sensitivity control.

TUNEUP INSTRUCTIONS:

Set tuning condenser one-quarter of the way in mesh or a little less, with a good signal coming through, then peak the XR–50 coils to give the loudest signal. You will find that when a signal is picked up on the receiver with the pre-amp in the circuit the signal strength can be increased by tuning the pre-amp with the variable condenser. From the antenna relay to the pre-amp 300-ohm ribbon should be used. From the pre-amp to the receiver 52-ohm coax should be used.

This pre-amp has been in constant use at A5OMH since 1949.

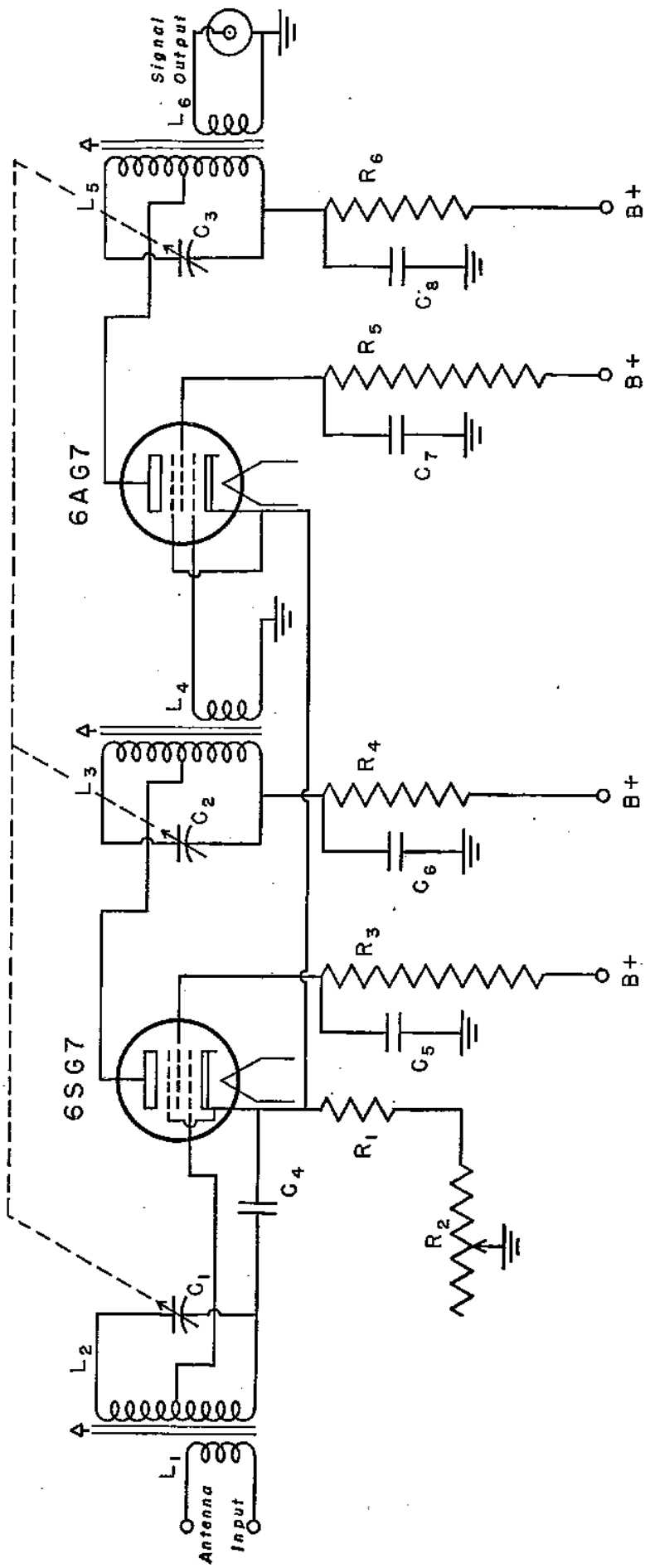

Signal Output
L_6
L_5
C_3
R_6
B+
C_8
R_5
B+
C_7
6AG7
L_4
L_3
C_2
R_4
B+
C_6
R_3
B+
C_5
6SG7
R_1
C_4
R_2
C_1
L_2
L_1
Antenna Input

FIGURE 1.

'ARTS LIST FOR THE PREAMPLIFIER UNIT:

1	Input tuning capacitor	50 mmfd variable.
2	Interstage tuning capacitor	
3	Output tuning capacitor	
4	1st r-f screen bypass	.01 mfd, 400 volts.
5	1st r-f plate bypass	
7	2d r-f screen bypass	
8	2d r-f plate bypass	
6	Blocking capacitor	.1 mfd, 400 volts.
1	Limiting resistor	200 ohms, 1 watt.
2	Sensitivity control	10,000 ohms, wirewound.
3	1st r-f screen dropping	50,000 ohms, 1 watt.
5	2d r-f screen dropping	
4	1st r-f plate decoupling	5,000 ohms, 1 watt.
6	2d r-f plate decoupling	
1	Input transformer primary	3 turns No. 18 AWG enameled.
4	Interstage transformer secondary	
6	Output transformer secondary	
2	Input transformer secondary	8 turns No. 18 AWG, enameled; center tapped.
3	Interstage transformer primary	
5	Output transformer primary	

EIELSON AIR FORCE BASE

Men of the 58th Strategic Reconnaissance Squadron, Eielson Air Force Base, Alaska, have access to MARS Station AK1AG.

Captain Dean Mohr, Director, and Philco Engineer Andrew Robson have worked to overcome some of the bugaboos of Arctic transmission. AK1AG has a power output of 500 watts.

Captain Mohr obtained an amateur license in 1947. He was a civilian living at Detroit, Michigan; his call letters were W8BEQ. After his recall to Air Force Duty in 1948, Mohr operated from Keesler Air Force Base in Mississippi with call letters W4RDF. He is now on the air (KL7AGN) from his quarters in Alaska.

SIGNAL CORPS EXTENSION COURSES OFFER FREE MILITARY AND TECHNICAL TRAINING

Signal Corps extension courses which provide free, streamlined instruction by mail in technical, tactical, and administrative Signal Corps subjects, offer MARS operators who are members of any component of the AUS a double-barreled opportunity for self improvement.

All military personnel benefit from taking the courses. MARS members can derive, in addition, specific technical information in the fields of radio and electronics. Included among the more than 100 courses offered are courses dealing with radio fundamentals, electrical fundamentals—AC and DC, antenna systems, theory and application of electron tubes, power supplies and regulation, television, and numerous others.

Extension courses are clearly written home-study programs designed to channel the student's efforts and enable him to absorb pertinent information in the shortest possible time. Their purpose is to help military personnel to expand their knowledge, increase their efficiency, and improve their chances for promotion through systematic spare-time study. The courses are mailed directly to the student wherever he may be. All study materials are furnished free of charge, including self-addressed, postage-free mailing envelopes.

Whether you are commissioned or enlisted—regular, reserve or National Guard—extension course study will give you accurate, current knowledge useful in your present duties, helpful in gaining promotion to a better assignment, and completion credits that add luster to your military record.

If you are enlisted, and seeking a promotion, the records show that one of the best ways to be sure of answering the questions of the promotion board correctly is to complete the 10 series of extension courses.

If you want a commission, successful completion of the 10 series courses will, in most cases, satisfy the minimum military educational requirements.

If you are a reservist, you need credit points for retirement and to retain active reserve standing. Reservists earn one retirement point for every three credit hours of extension course work satisfactorily completed.

Enrollment is easily accomplished. Ask your unit commander, or unit instructor, for four copies of DA Form 145 (Application for Enrollment), fill them in and return them to your commanding officer for forwarding, by indorsement, to Director, Department of Nonresident Instruction, Fort Monmouth, N. J., for appropriate action. Indicate on your application that you are a MARS member.

MILITARY AMATEURS IN AUSTRALIA

The following information on military amateur radio in Australia has been furnished the MARS BULLETIN *for publication from the Australian Military Mission in Washington, D. C.*

"Since the end of World War II, approval has been granted for certain units of the Australian Military Forces to form radio clubs and operate experimental radio stations as an impetus for training. In addition, personnel in possession of a current amateur operator's certificate of proficiency may be given permission to operate their own amateur stations on Army property.

"At the present time membership of unit radio clubs is restricted to active members of the unit, i. e. serving Regulars or members of the CMF, whilst the aims of such clubs are confined to the stimulation of interest in radio among unit members and to act as a training medium. For this reason AHQ approval has been given, in certain cases, for radio clubs to use Service pattern wireless equipment.

"To insure that the Security aspect of these activities is safeguarded it is necessary for operators to adhere to the following instructions:

a. When and where a current Service set is being used no mention will be made of this fact nor the type of set nor any associated equipment, nor its role in the service nor its technical design. Such a set may be described only in the broadest outline, 'A six valve, master oscillator transmitter.' The wattage and aerial type may be stated.

b. Irrespective of whether Service pattern equipment is in use or not, no mention will be made on the air or on QSL cards of any matters pertaining to the Army or the name or location of any unit other than a permanent fixed establishment.

c. No mention will be made of the rank of any operator or any member of the club.

"In all cases the provisions of the Wireless Telegraphy act, 1905–1950 and the Regulations made thereunder, must be rigidly observed. The use of equipment capable of delivering power much in excess of 100 watts has been reported in some instances; in this regard the use of Wireless Sets Number 133 and 153 are contrary to the Regulations because, with either set, an output of 300 watts is possible although the set will be normally operated when switched to low power.

"Recent reports from Commands indicate a desire on the part of local radio clubs to conduct scheduled 'hook-ups' with other clubs and, as there is no obvious reason why this should not be arranged, inter-club action should be initiated to build up an organization similar to the American MARS (Military Affiliate Radio System).

"Since MARS was formed in November 1948, nearly 10,000 amateurs have joined its ranks. To be eligible amateurs were required to have

some military affiliation, either as active members of one of the U. S. Services, or as a member of a Service Reserve, or National Guard (equivalent of the CMF).

"However, this restriction was lifted in November 1950, and now selected civilian amateurs are allowed to participate in the network as part of the National Defense System. The purpose of MARS is—

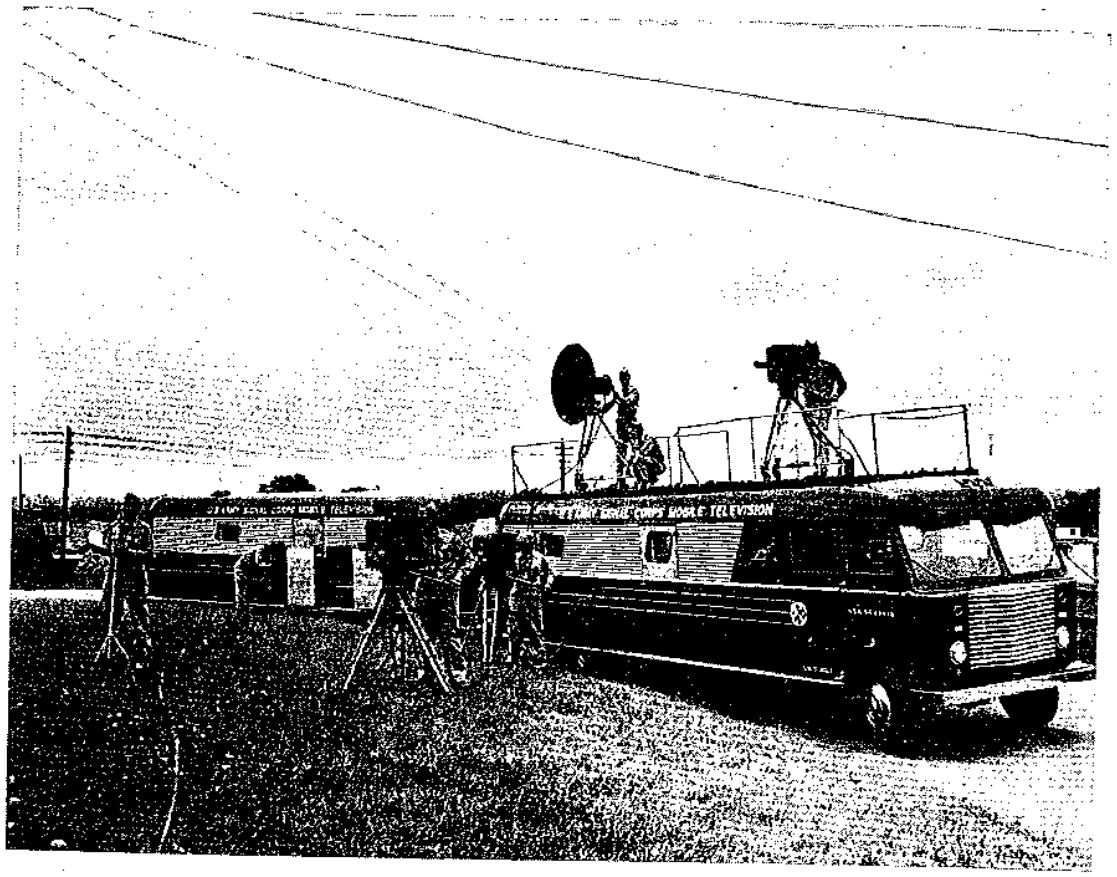
(*a*) To create interest and further training in military communications.

(*b*) To coordinate practices and procedures of amateur radio operations with those of military communications and

(*c*) To provide an additional source of trained radio communications personnel in the event of local or National emergency.

"The basis of the organization of MARS is that it will follow those channels of command currently prescribed for components of the U. S. Army. It is organized to provide a complete radio network, throughout the continental limits of the United States, which can be made readily available to military commanders, Red Cross representatives or other authorities who may be charged with emergency responsibilities in a given area. To make this possible, operating frequencies, outside the amateur bands, are allotted by the Army and Air Force.

"The establishment of such a system within the AMF would no doubt attract recruits to CMF Signal units from among the amateur ranks and it is already known that the Wireless Institute of Australia is interested in the matter."



THE MOBILE TELEVISION UNIT ON LOCATION.

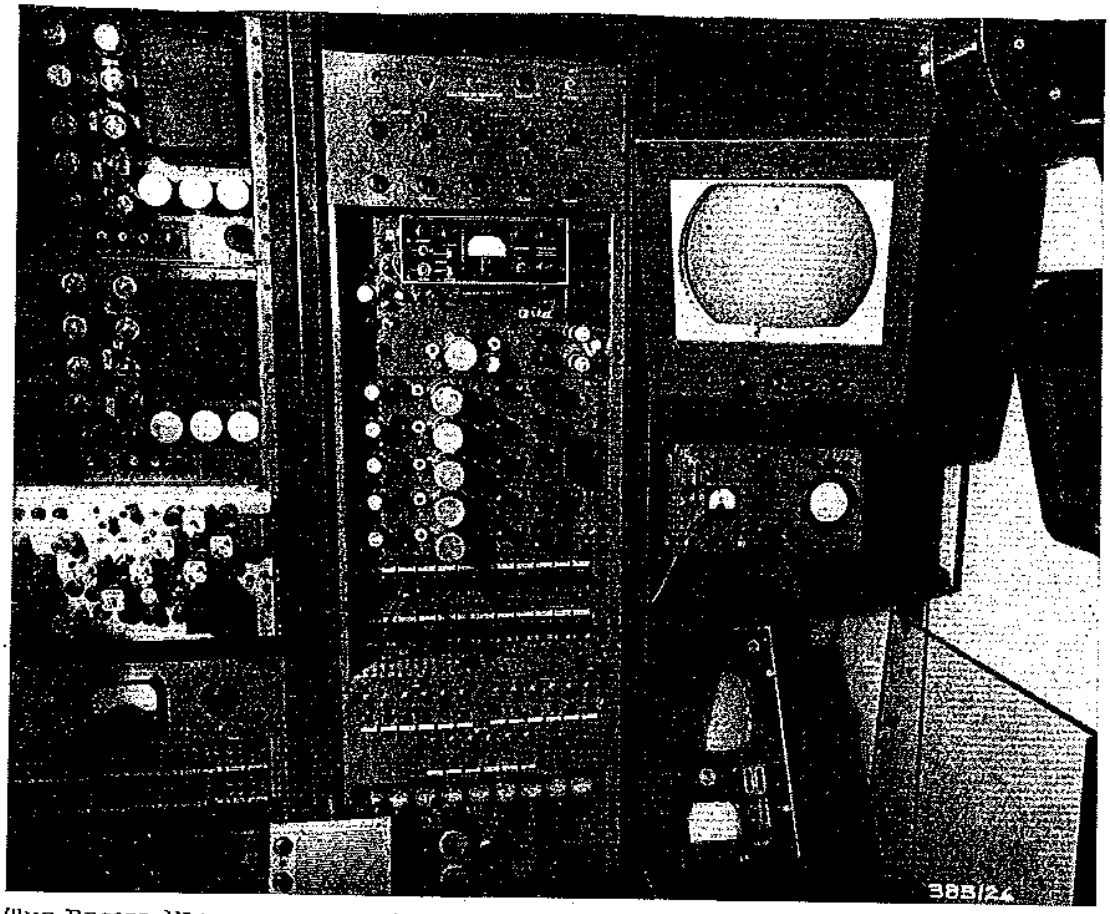
SIGNAL CORPS MOBILE TV SYSTEM

Of interest to MARS members is the recently developed mechanized television system planned at the Signal Corps Engineering Laboratories, contracted for and delivered by RCA and currently being demonstrated throughout the Army.

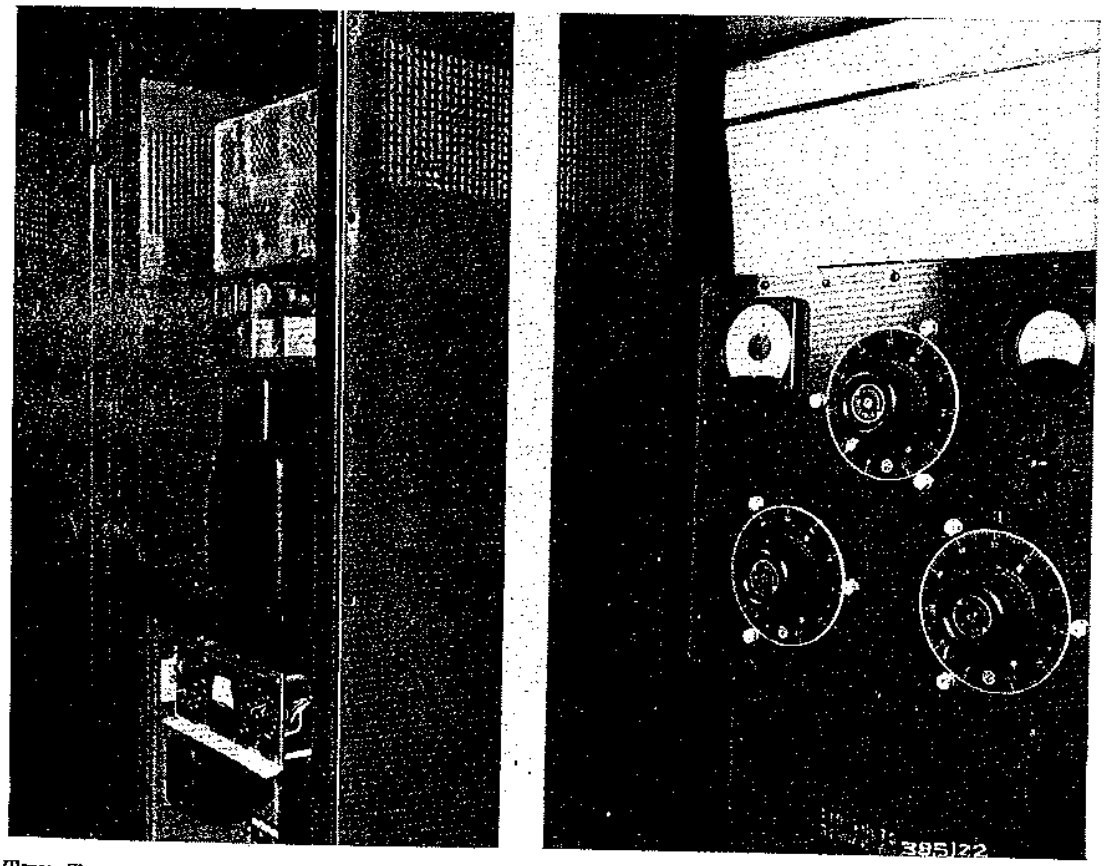
The system consists, basically, of four buses, housing cameras and transmitting equipment, a receiving unit, and two power units.

In addition to housing the units the four buses furnish organic transportation. Unit 1 contains transmitting equipment and three cameras which are controlled by two officer-directors. Unit 2 always accompanies the first and provides the power needed by means of two 15 kw gasoline motor generators. Unit 3 has the receiver unit which feeds out the show by coaxial cable to any of ten 16-inch screens or to one life-size 6 x 8 foot screen. Motion picture film can be integrated from this van and projected on the screens. Unit 4 serves as power unit for Unit 3.

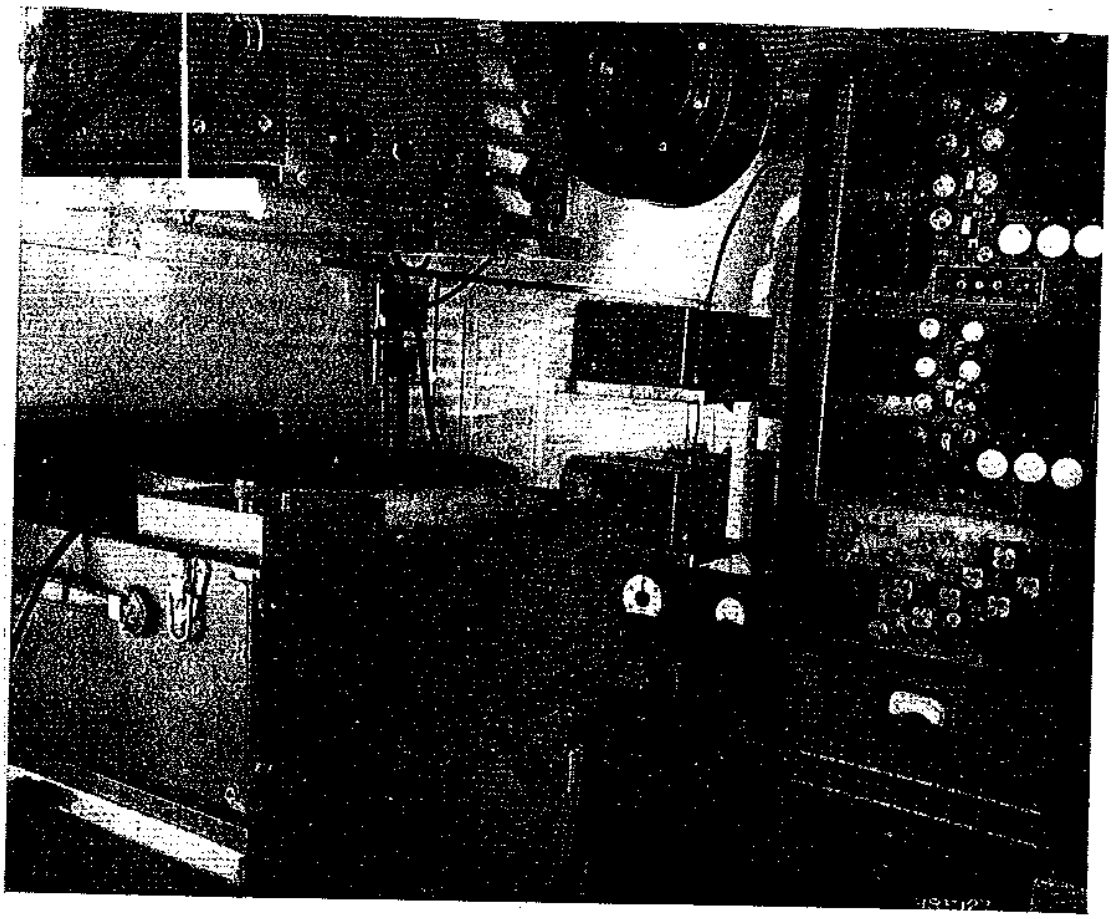
The mission of the Television System is to stimulate interest and thinking as to the tactical application of television, and to experiment with its application to military training programs. It is also to be used to promote public information activities by telecasting on-the-spot news events of military interest.



THE RECORD PLAYBACK ON THE RECEIVING AND DISTRIBUTION PANEL IN THE REAR OF UNIT NO. 3.



THE TRANSMITTING PANEL FOR FM AND MICROWAVE TRANSMITTERS. ON THE RIGHT IS THE LINE VOLTAGE REGULATOR.



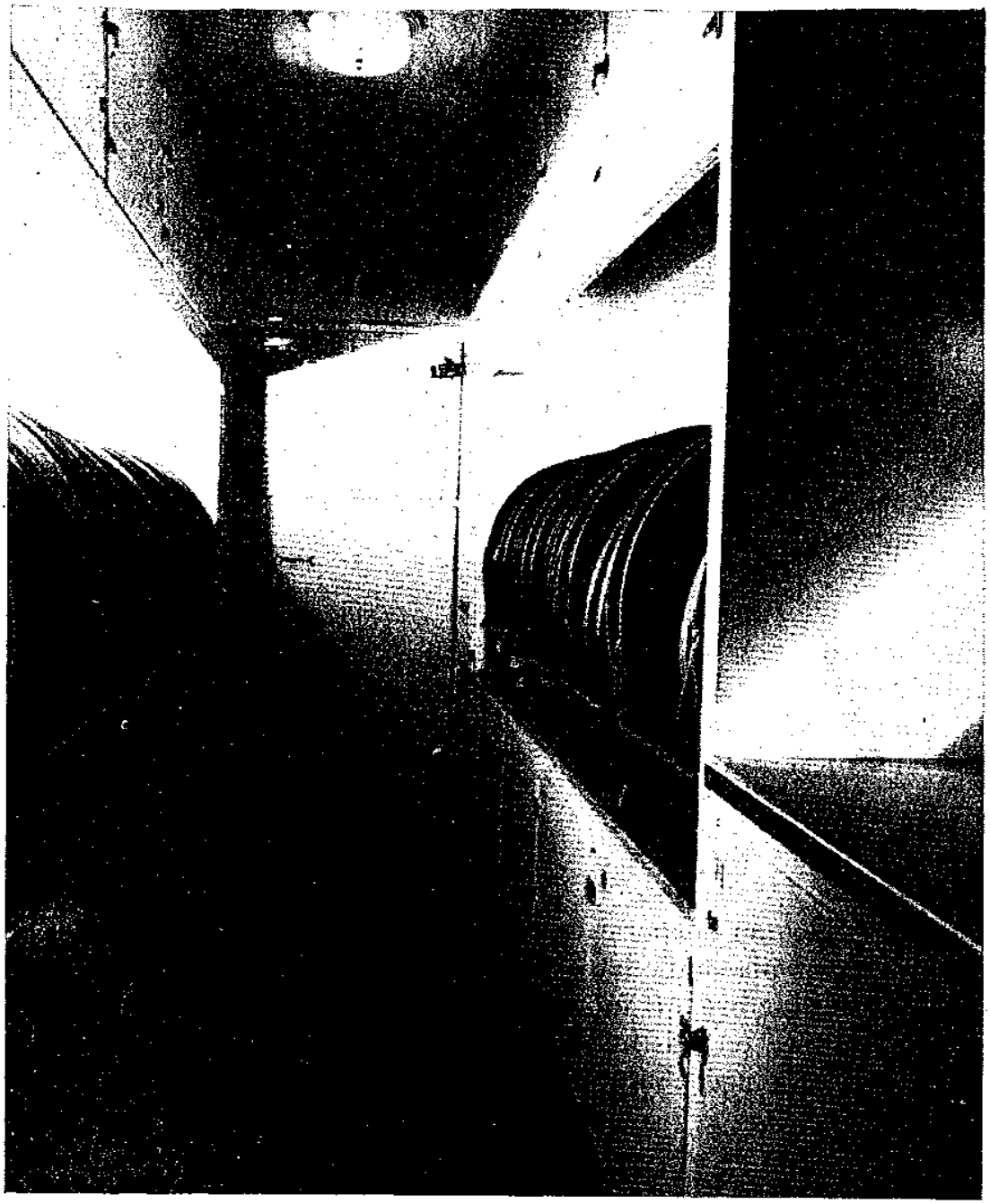
THE RECORD CUTTER AND PLAYBACK DISTRIBUTION PANEL INSTALLED IN THE REAR OF UNIT NO. 3.

The first practical application of the system to a training program came late in 1951 in conjunction with the Officers School at Fort Monmouth, New Jersey. A 1-hour course of instruction in fixed station radio was telecast from one building to another. The advantages included bringing the television picture of the control dials almost to the individuals' desks, affording clear and unobstructed vision impossible in a crowded auditorium.

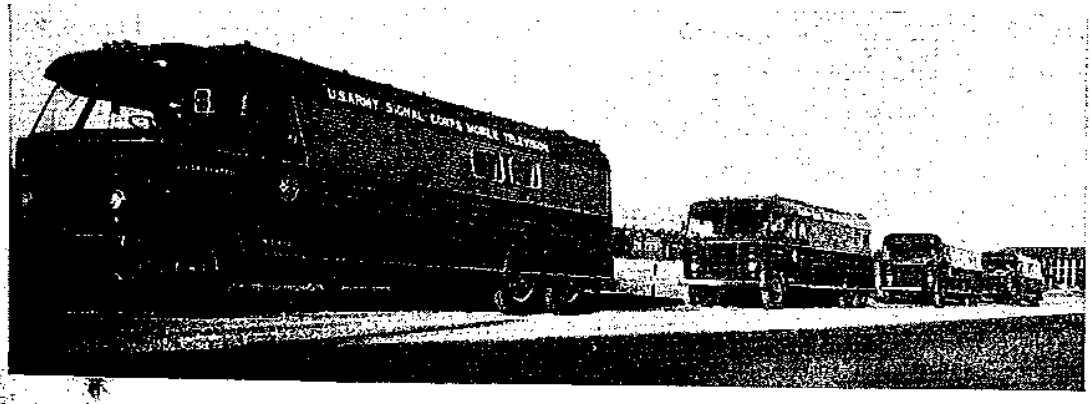
Early in 1952 the system was put to use to follow a field problem involving infantry troops. With long range lenses, television cameras followed the troops through 600 yards of brush to the objectives and screened the show in Fort Monmouth classrooms.

This maneuver demonstrated, effectively, that point-to-point transmission, although desirable, is not always possible. The mobile system has experimented successfully with the use of microwave relay equipment to go around mountains and other interfering terrain features that make line-of-sight beaming impossible.

In the experimental stages, field tests were run to determine the range of the microwave system, to determine the range of the FM radio carrying the audio signal, and the range of the police-type radio used for intercommunication.



THE WIRE CABLE STORAGE COMPARTMENT IN THE REAR OF UNIT NO. 4.



THE ARMY SIGNAL CORPS TV UNIT HITS THE ROAD.

USAF ECLIPSE EXPEDITION

The Air Force Eclipse Expedition to Khartoum, Sudan, to observe the 1952 lunar eclipse was heavily publicized and widely reported throughout the nation.

Not so well known is the fact that a MARS station accompanied the expedition. In addition to MARS facilities at the base camp at Khartoum, five other observation stations were located at carefully selected sites across Africa and Saudi Arabia. Constant and reliable communication service to and between the sites and Headquarters, Aeronautical Chart and Information Service, Washington, D. C., was essential.

The Chief, MARS Air Force, Maj. Charles C. Mack, reports that communication by commercial means offered great problems. There were no commercial services between Khartoum and the nearest USAF installation, Wheelus Airfield, Tripoli.

Col. Paul C. Schauer, USAF, Expedition Leader stated that "Transmission of messages through the MARS system was a substantial factor in the success achieved by the USAF Eclipse Expedition, 1952."

Major Mack reports that the experience of this expedition proves the value of MARS to projects of this kind.

CONCERNING CRYSTALS

Cranke Vacuum Corporation of Chicago, Illinois, is manufacturing a new type of planetary lap which apparently can be applied easily to the manufacture of fairly thin and very flat quartz crystals. Samples lapped on this machine have been submitted to the Signal Corps Engineering Laboratories for test.

UNITED NATIONS DAY—1952

On United Nations Day, 24 October 1952, MARS Headquarters Stations WAR and AIR transmitted a message from the Commander-in-Chief, U. S. Armed Forces—President Harry S. Truman. The message was addressed to all MARS members and was extracted from the President's remarks at the U. N. Day observance in Washington.

Capt. Frank F. Long, Maj. Joe R. Patton and Master Sergeant Lawrence R. George inspect the BC–610 transmitter at AF4FBA.

TURNER AIR FORCE BASE, GA.

The MARS Station at Turner Air Force Base, Georgia, was established by Maj. Joe R. Patton, 31st Communications Officer, upon return of the 31st Wing from England.

Equipment was procured from the 2d Air Force and Master Sergeant Lawrence George placed on special duty with the 31st Headquarters to serve as NCOIC of the station.

During the summer months Sergeant George conducts a course for amateur radio operators.

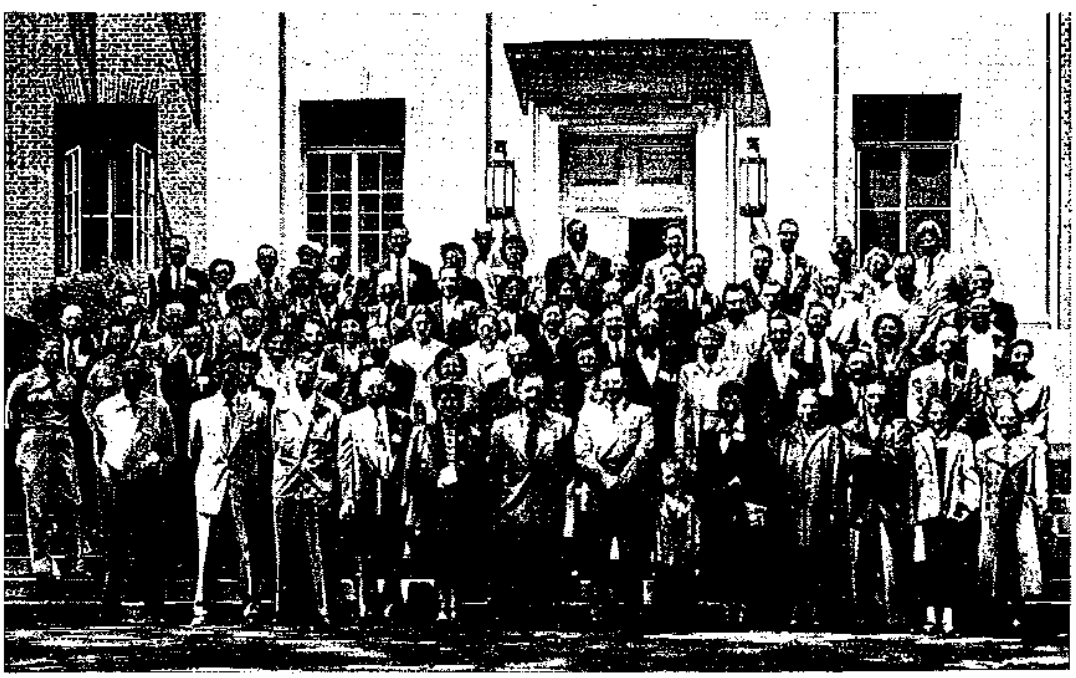
About 1 year ago Sergeant George heard Westover Air Force Base, Massachusetts, trying unsuccessfully to reach Headquarters USAF with a message concerning a B–29 aircraft downed somewhere in the north Atlantic. Training and know-how paid off. He cut in and relayed the message to Washington. Further relay was effected to Pepperell, Newfoundland; Kindley, Bermuda; and Lagens, Azores Air Force Bases. The site of the crash was located in a short time.

The Turner MARS Club consists of two groups—Men who do not hold amateur licenses, and men who know Morse code well enough to communicate at a rate of five words per minute. Meetings are held twice a week and demonstrations and instructions given by M/Sgt. George, M/Sgt. Walter Maurer, Jr., and T/Sgt. Allen Maxwell, Jr. Advisors are Major Patton and Capt. Frank F. Long.

ACTIVITIES AT LARGE

BOVE: Members of the First Army MARS Advisory Committee photographed at a recent meeting in New York City.

ELOW: A turnout of MARS members for a State-wide conference on the campus of Pennsylvania State College to discuss Second Army policies and Pennsylvania MARS activities.



ABOVE: Nathaniel G. A. Dorfman demonstrates his CODETYPER at a Third Army MARS-fest, Winston-Salem, North Carolina.

BELOW: ET-1 Austin C. Farrell (AF2BXE) and Pfc Lloyd A. Burrows (W6IMY) are shown operating equipment at AA5WSP.

A Japanese microphone is displaced with some of the QSL's collected at AA5WSP, White Sands Proving Ground, New Mexico.

Capt. Charles A. Koppe and Maj. Dominic A. Bartol operate AF7FBL, Mountain Home Air Force Base, Idaho.

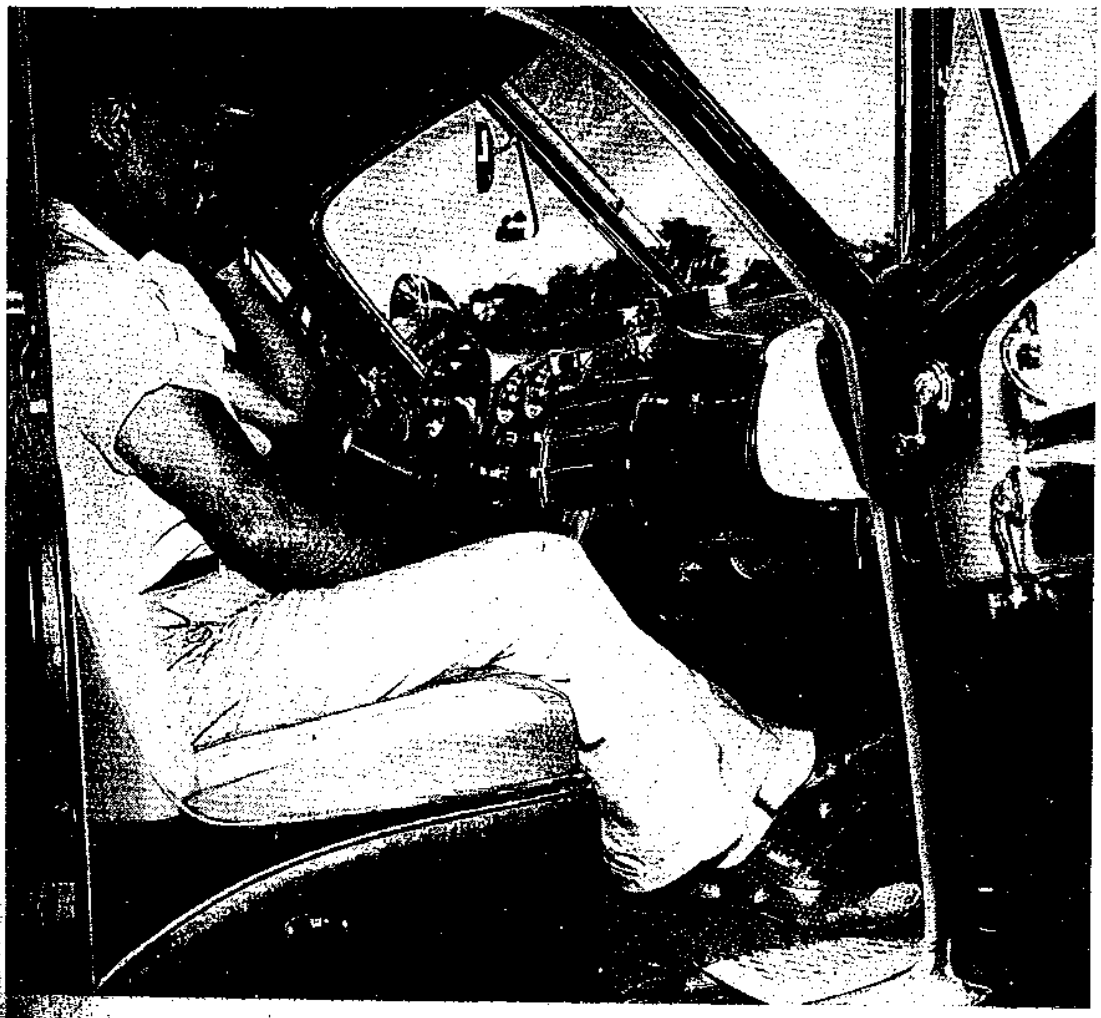
TESTING MARS IN PANAMA

The Panama Area Military Affiliate Radio System was put to a test in May 1952 as it took part in "Operation Jackpot," a unified effort of the Armed Forces to determine the effectiveness and readiness of the military personnel, their dependents, and civilian workers to handle "disaster" situations in the Panama area.

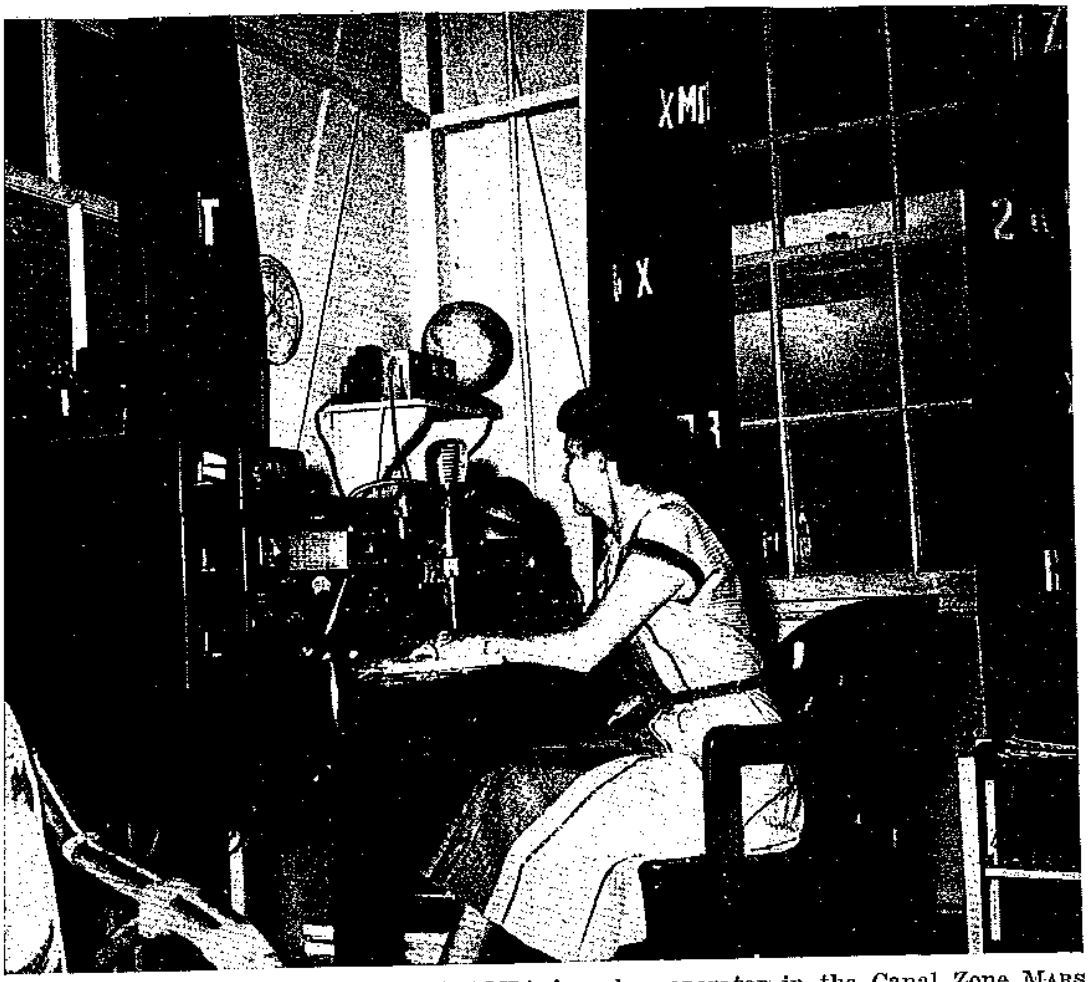
At 0820 local time on 8 May, an alert was sounded across the Isthmus. At 0830 a theoretical "A" bomb was exploded in one of the locks of the Panama Canal. Immediately upon receipt of an "all clear," AC5SM operated by Maj. H. J. Parry (AC5JQ), MARS Director Caribbean, called the emergency net into operation. Fourteen stations, including two mobile stations, were netted and ready for action in 15 minutes.

After the net was organized, AC5AA assumed net control and AC5CB replaced AC5JQ at the mike for AC5SM.

Members participating included AC5's AA, AZ, CB, DG, EE, FK, CG (mobile), JZ, ML, PC (mobile), SM, WB; AC6's AW, CN, WA; AC7LM; and AH6AA CN, DG, LM and ML are all YLs, active in daytime net operations.

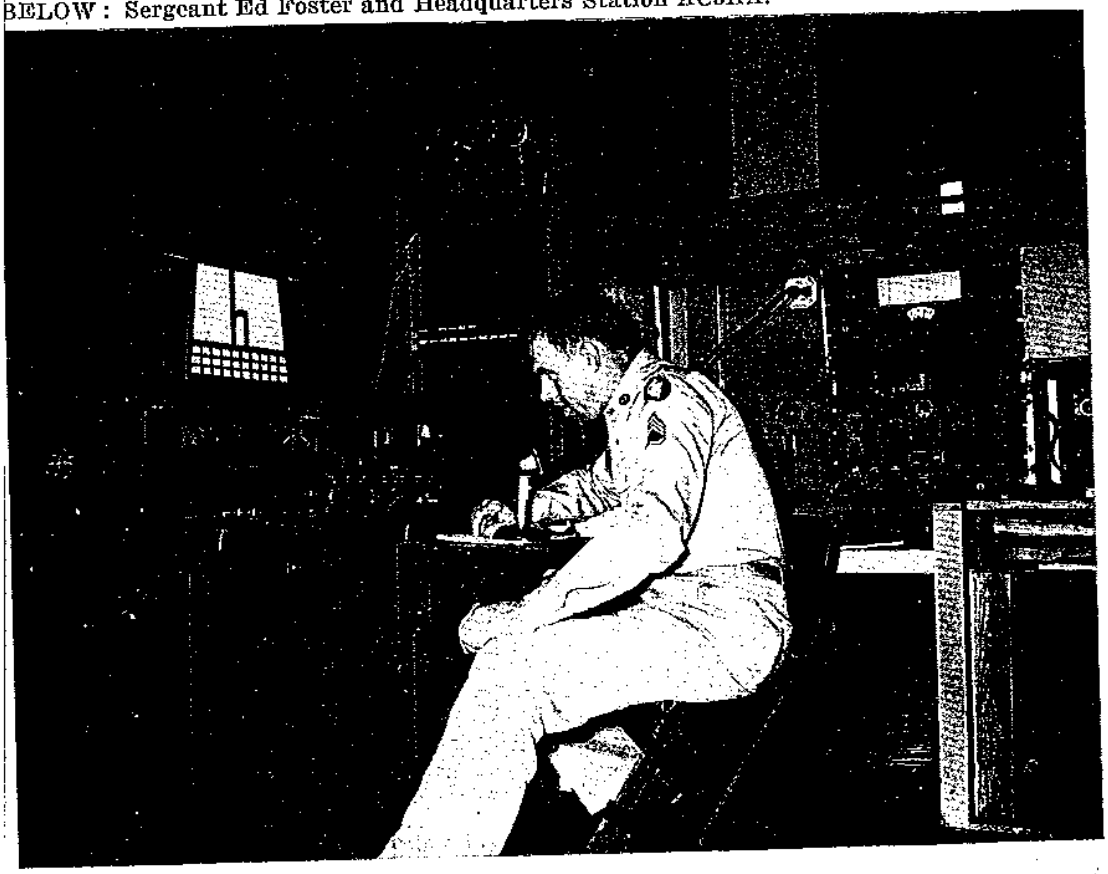


P. C. COMBS (AC5PC) AT THE CONTROLS OF HIS MOBILE RIG.



ABOVE: Mrs. Frank H. Lerchen (AC5ML) is a key operator in the Canal Zone MARS from her QTH at Diablo Heights.

BELOW: Sergeant Ed Foster and Headquarters Station AC5AA.



V. F. W. HONORS AF4PJU

Gratton George (AF4PJU) of Clewiston, Florida, has received the V. F. W. Good Citizenship Medal from Hawkins-Kirk-Gordon Post No. 4185, Veterans of Foreign Wars of the United States. The presentation was made by L. V. Bybee, former V. F. W. National Aide-de-Camp.

Gratton is an arthritis invalid. Four years ago he determined to engage in a useful hobby. With encouragement and assistance from his XYL, Irene, he struggled to master the International Morse code with his badly crippled hands.

Sometimes AF4PJU must use special devices—tubes with claw-like fixtures which fit on the knobs—to throw the switches and control the dials.

High on Gratton's list of personal accomplishments is the message he relayed from Portugal. A child was critically ill with spinal meningitis and a rare drug was needed to save her life.

Through contact with a New York City amateur W4PJU relayed the plea for help to a New York City newspaper. Within 6 hours after the call went out from Portugal the drug was on its way by commercial air line from the United States.

For his part in this Mr. George received a personal letter of thanks from Portuguese Ambassador Luis Esteves Fernandes.

Because he has almost unlimited time for operation, AF4PJU is a valuable MARS member and a key station for the Southern States. He has received authority to operate not only with Air Force stations but also to participate in Third Army MARS nets.

A4KJ, Florida Army MARS control station, estimates that W4PJU/AF4PJU handles 1,200 messages per month.

OPERATION ABERDEEN

MARS Station AA3WAS at Aberdeen Proving Ground has passed the midpoint in phase two of Operation Aberdeen which is the operation of an active outlet for personal type messages during Preventive Maintenance School at Aberdeen Proving Ground, Maryland.

The first school was held 11 March 1952 through 13 June 1952 for senior officers, many of them Corps and Division commanders.

The second school is now underway. Complete returns are not available for the current course, but 140 messages were handled in the first school period for members attending the PM course. During this same period 540 messages were handled "off post."

Equipment available at AA3WAS and augmented as a special MARS Headquarters project included a BC 610 and a Viking I transmitter, and a Collins 75 A and an NC 100 receiver. A Meissner Signal Shifter was employed as VFO; a rotary beam antenna was installed.

MARS RADIOTELETYPEWRITER ACTIVITY

Considerable interest has been shown by MARS members in the evelopment and operation of MARS radioteletypewriter equipment. Details of net operation throughout the system are not yet available. lowever late reports from the East Coast region show the four- ation net controlled by A4OLL, Jack Brown of Herndon, Virginia, as been conducting some experiments on the MARS frequency of 497.5 kc. Working with A4OLL are A4FJ, Ted Mathewson of lichmond, Virginia; AA2WAO (opr. Steve) of Fort Dix, New Jer- ey; and A4SQF, Bud Sable of Alexandria, Virginia.

Communications between all stations of the net have ranged from xcellent (solid copy) to poor (50 percent or less). In general, poor opy has been attributed to CW transmissions on, or close to the net requency. Some poor copy is the result of bad propagation condi- ions. However, only a small percentage of "error" copy has been raced to this factor.

The net concerns itself primarily with working out standards for MARS teletypewriter operation, including feasible procedures and prosigns, and a determination of how many stations can work on a simplex basis on a fixed frequency. Compilation of the eventual results is expected to be of assistance when the amateur frequencies are available for radioteletypewriter operation.

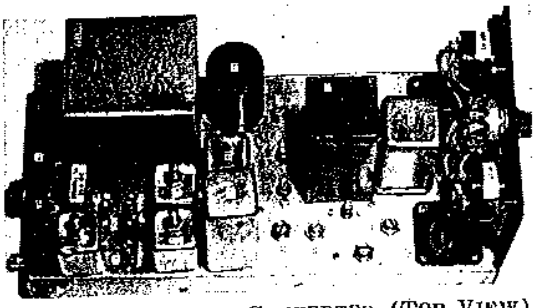
The net operates on Saturdays during the period 1800Z to 1900Z and 2000Z to 2100Z. A secondary period of operation from 2000Z to 2100Z on Sundays also has been established. All operations and use of net time was cleared through the Chief, MARS (Army).

MARS Headquarters is interested in learning how many MARS members have equipment for copying teletypewriter transmissions. In addition to the planning and establishment of nets, monitors are desired to furnish information on the strength, type of copy, distance versus fade effect and other valuable planning data.

Future plans include the transmission of the weekly MARS Broadcast by RATT from MARS Headquarters as well as by CW. Times and frequencies will be included in the weekly broadcast on CW when RATT transmissions begin.

If you have teletypewriter equipment, or plan the early procurement of RATT facilities for your station, please send complete information to MARS Headquarters through your regular command channels.

MILITARY USE OF TRANSISTORS



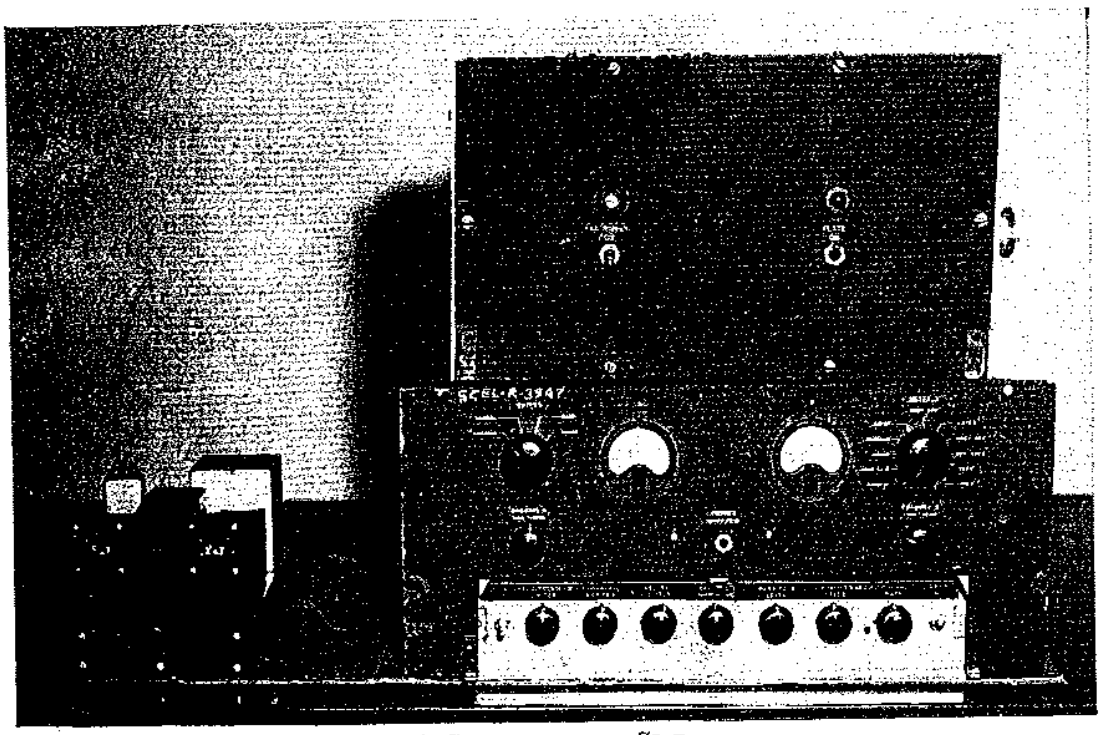
THE EXPERIMENTAL CONVERTER (TOP VIEW).

Transistors used by the Army Signal Corps are helping to develop better and lighter communications equipment. Replacing fragile and comparatively short lived vacuum tubes, the solid germanium crystal transistors withstand vibration and shock, have an estimated life of 7 years continuous use.

Used in an experimental converter with radio teletypewriter equipment, transistors cut the weight of the unit to 10 pounds instead of the usual 100 pounds. They permit operation on 1½ watts power supplied by dry batteries instead of 175 watts supplied by heavy motor generator.

Development of transistors and military adaptation of current development is conducted at the Signal Corps Engineering laboratories.

Pictured above is a top view of the experimental converter. While it will take two of the new equipments to do what the old one will do, the saving in weight still is about 10 times. Note comparison picture below.



A COMPARISON IN SIZE.

1952 ARMED FORCES DAY—HAWAII

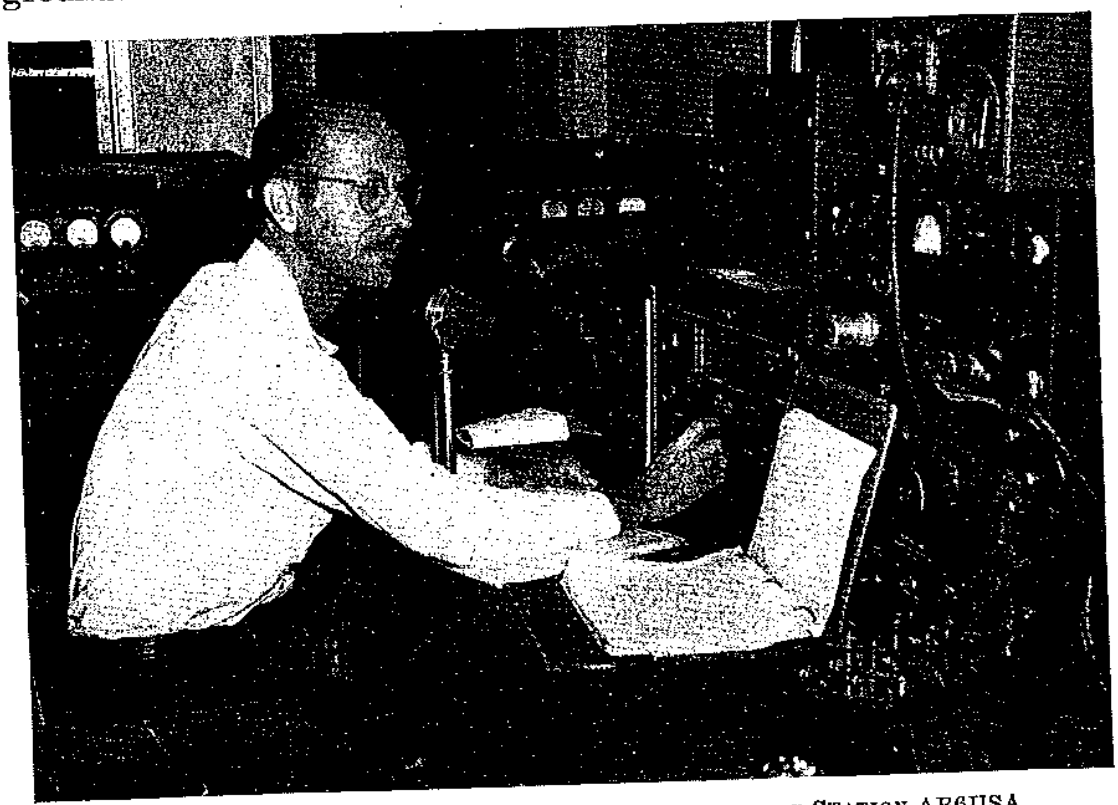
(Ed. Note: It's not too soon to be making plans for your station to participate in Armed Forces Day activities for 1953. Can you match what the gang in Hawaii accomplished in '52?)

Army and Air Force MARS members of Hawaii pooled their resources to establish a fully equipped MARS station at the 49th State Fair, Sand Island, T. H., during the week of Armed Forces Day—17 May 1952.

A two position station was installed to provide simultaneous two-band operation. One position utilized a BC–610, Collins 310–B Exciter, Collins 75 A–1 Receiver and a Hammarlund Super-Pro. The other position was an Air Force "package unit" featuring a 32V2 transmitter and a 75 A–2 Receiver. A 5-inch scope indicated modulation patterns for the spectators. A 75 meter doublet and a 10 over 20 Gordon Roto Beam antenna were installed. The beam was set on a 60-foot pole with large 30-inch bright red letters spelling out M A R S fastened to it. Floodlights made the beam an effective display during the evening hours.

A large map of the world, centered on Hawaii, was prepared to illustrate countries contacted by AB6USA. Colorful QSL cards were selected and used to identify countries on the map.

Four operators were on duty during Fair hours to handle traffic, answer questions and work regular MARS USARPAC drill nets.. Approximately 500 messages were cleared to stateside from the fairgrounds.



MEL VITTUM (AB6AO) AT THE USARPAC HEADQUARTERS STATION AB6USA.

MARS AMATEUR EXTRAS

As previously announced the MARS BULLETIN is glad to publish the calls of MARS members who are licensed by the Federal Communications Commission as Amateur Extra Class Radio Operators. Names of MARS members who qualify for this list should be furnished to The MARS BULLETIN, Room BE 1000, The Pentagon, Washington, D. C. The following names were furnished as of 1 January 1953:

*Thomas Greenhalgh, W1QYY (AF1QYY)

*Dan Lindsay, W2PLD (trustee A2KYN)

*Clay Cool, W2EBZ (A2EBZ)

*Norman Hester, W9CSK (AF9CSK)

*Lawrence Rudolph, WØQHK, (AFØQHK)

*Joe Beler, W5PGF (AF5PGF)

*Ruel Edrington, W5PNM (AF5PNM)

*Donald Lyncy, KH6AML (AB6AML)

*Yutak Arakaki, KH6CH (AB6CH)